



STATE OF DELAWARE

**DEPARTMENT OF NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL**

DIVISION OF WATER

RICHARDSON & ROBBINS BUILDING

89 KINGS HIGHWAY

DOVER, DELAWARE 19901

**COMMERCIAL &
GOVERNMENT SERVICES:
WASTEWATER,
STORMWATER, &
BIOSOLIDS
MANAGEMENT**

PHONE
(302) 739-9946

Public-Notice Fact Sheet

May 24, 2023

City of Seaford
Wastewater Treatment Facilities
P.O. Box 1100
414 High St.
Seaford, Delaware 19973

NPDES Permit No. DE 0020265
State Permit No. WPCC 3161G/74

The City of Seaford has applied for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit No. DE0020265 permit to continue discharging the effluent from its wastewater treatment facility to the Nanticoke River.

Proposed Changes

1. Added total suspended solids (TSS) and BOD₅ influent monitoring to Part I.B.1. of the permit.
2. Removed limits for copper.
3. Revised limits for nutrients based on Bridgeville WLA transfer.
4. Revised "Reporting" in Part I.D. requiring permittee to submit results via the Department approved Electronically Generated Discharge Monitoring Report (eDMR).
5. Added a standard condition "Notifications Specific to Manufacturing, Commercial, Mining, and Silvicultural Dischargers" in Part II.A.2.
6. Removed Special Condition 3 which provided for reopening the permit, if necessary, to modify the effluent limitations for nitrogen and phosphorus based on TMDL requirements. The proposed permit has nutrient limits based on the Nanticoke and Chesapeake Bay TMDLs and does not include interim limits.
7. Removed Special Condition 5 which outlines the Nitrogen-Phosphorus Trade Agreement (NPTA) and requirements in the event of its termination. The proposed limits are based on a permanent status of the allocations resulting from the NPTA.
8. Removed Special Condition 15 which required Waste Load Allocation transfer from Bridgeville to Seaford upon start-up and commissioning of the Western Sussex Regional System.
9. Added a new Special Condition No. 4 requiring the permittee to demonstrate a minimum of 92.5% reduction in the raw waste TSS and BOD₅ concentrations on a monthly average basis prior to discharge.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 2

10. Added a new Special Condition No. 14 pursuant to 40 CFR part 136 to ensure the use of EPA-approved analytical methods that are capable of detecting and measuring the pollutants at, or below, the applicable water quality criteria or permit limits.

Background Information

Activity Description

The wastewater treatment facility is located at 403 Nanticoke Avenue in Seaford, Delaware. A map showing the specific location of the treatment facilities is provided on page 2 of the permit. The City of Seaford operates and maintains wastewater treatment facilities for primarily domestic sewerage and some industrial users from Seaford, the neighboring community of Blades, Greenwood and Bridgeville. Seaford wastewater treatment facilities began serving Greenwood and Bridgeville following the closure of the Town of Bridgeville wastewater treatment facility. Seaford maintains a pretreatment program to regulate the industrial users. The pretreatment program is administered by EPA since the Department does not have authority to implement the program.

Statutory and Regulatory Basis

The Delaware Department of Natural Resources and Environmental Control (DNREC) proposes to reissue an NPDES permit to discharge the wastewater subject to certain effluent discharge limitations, monitoring requirements and other terms and conditions identified in the draft permit. Section 402 of the federal Clean Water Act, as amended, and 7 Del. C. Chapter 60 provide the authority for permit issuance. Federal and state regulations promulgated pursuant to these statutes are the regulatory bases for permit issuance.

Receiving Stream Classification

The designated uses for the Nanticoke River are: industrial water supply; primary contact recreation; secondary contact recreation; protection of fish, aquatic life and wildlife; and ERES (Exceptional Recreational or Ecological Significance). Additionally, the Nanticoke River from the upstream-most limits of the City of Seaford to the Maryland State Line and the Broad Creek from the upstream-most limits of the Town of Laurel to the confluence with the Nanticoke River, have the following special designated uses: Protection of Migratory Fish Spawning and Nursery (February 1 – May 31) and Open-water Fish and Shellfish (year-round). These uses are consistent with the Maryland portion of the tidal Nanticoke River and as described in the EPA 2003 document (and addendums) *“Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries.”*

The Nanticoke River is one of the largest watersheds in Delaware and ultimately discharges to the Chesapeake Bay in the State of Maryland. The entire Nanticoke River in Delaware is freshwater, and the southern portion of the river is tidally influenced.

Regulatory agencies classify water bodies according to their designated uses (e.g., aquatic life protection, fishing, swimming, etc.). Agencies assess whether each body supports (“attains”) each of its designated uses, and report their assessments in “305(b)” Reports¹. When a stream

¹ Called “305(b) Reports” because they are required under Section 305(b) of the Federal Clean Water Act.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 3

is in non-attainment of a designated use, it must be listed on a “303(d) List” (See Table 2, “Final Determination For The State Of Delaware, 2002 Clean Water Act Section 303(d) List Of Waters Needing TMDLs”, for the Delaware River waters), which shows the cause of the impairment, and a schedule for agencies to address those impairments, usually via the TMDL².

Discharge Description

One (1) outfall from the wastewater treatment facilities is identified in the permit. Outfall 001 is the effluent from the wastewater treatment facilities operated and maintained by the City of Seaford.

Proposed Effluent Limitations

DNREC has examined the application and proposes to issue the applicant's permit for a period not to exceed five (5) years, subject to the effluent limitations and monitoring requirements in the attached permit. Following is the basis for the proposed limitations.

Basis for Effluent Limitations

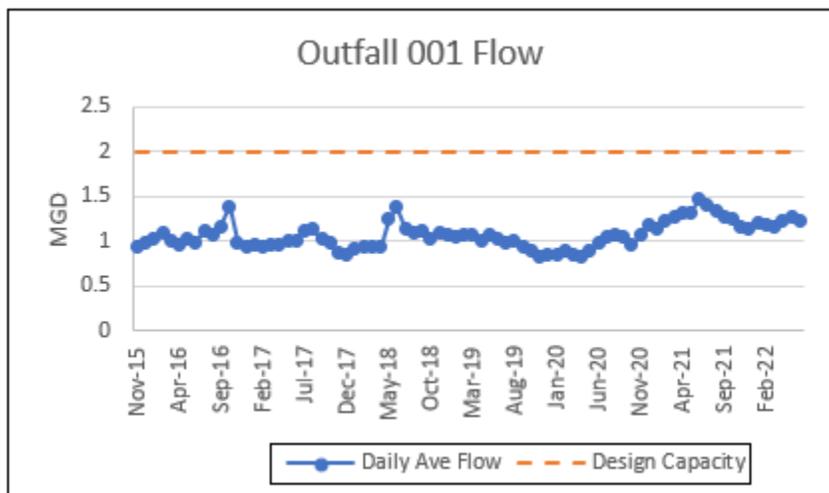
Prior to 1991, the design flow of the wastewater treatment facility (WWTF) was 1.08 million gallons per day (mgd). The WWTF has been upgraded to accommodate commercial, industrial, and residential growth in the area. BOD5 and TSS load limits have been capped at levels established for that old 1.08 mgd flow rate. Later TMDLs and the Delaware Chesapeake Bay Watershed Implementation Plan (WIP), discussed in more detail below, have retained those capped limits for BOD5 and TSS.

Flow

The design capacity of the treatment facility is 2.0 MGD. Current permit has no flow limit and instead there is a footnote stating, “The hydraulic design discharge rate of 2.0 million gallons per day was used in determining the effluent limitations for this outfall.” The figure below shows the average daily flow reported over the past several years.

² “TMDL” is the “Total Maximum Daily Load” from point, nonpoint, and natural background sources that a water body can assimilate and still support designated uses.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 4



TMDL-based Limits

The City of Seaford NPDES permit requirements are based on the requirements of three TMDLs.

Applicable TMDLs				
Watershed	Developed by	Year	Analysis Documents	Regulations
Nanticoke River	DNREC	1998	Nutrients in the mainstem of the Nanticoke River and Broad Creek³	Nutrients⁴
Nanticoke River	DNREC	2006	Bacteria⁵	Bacteria⁶
Chesapeake Bay	EPA	2010	Nutrients and Sediments⁷	

The Department issued a “final” TMDL for BOD5, Total Nitrogen (TN) and Total Phosphorus (TP) in the Nanticoke River and Broad Creek on November 6, 1998 (Secretary’s Order No. 98-W-0045). That Nanticoke TMDL required the three municipal wastewater treatment facilities (WWTF) in the Nanticoke River and Broad Creek Watershed to employ biological nitrogen removal (BNR) or equivalent resulting in load reductions of about 50% and 24% for TN and TP respectively from the three facilities. These three facilities include **Seaford Sewage Treatment Plant**, Bridgeville Sewage Treatment Plant, and Laurel Sewage Treatment Plant.

The current Seaford WWTP constructed in 1998 is a BNR facility.

Table 4 -1 of the “Total Maximum Daily Load (TMDL) Analysis for Nanticoke River and Broad Creek Delaware⁸” lists the Seaford WWTF’s waste load allocations as follows:

³ http://www.dnrec.delaware.gov/swc/wa/Documents/TMDL_TechnicalAnalysisDocuments/16_NanticokeMainTMDLAnalysis.pdf
⁴ <http://regulations.delaware.gov/AdminCode/title7/7000/7400/7406.shtml#TopOfPage>
⁵ http://www.dnrec.delaware.gov/swc/wa/Documents/TMDL_TechnicalAnalysisDocuments/15_ChesDrainBasinsBacteriaTMDLAnalyses.pdf
⁶ <http://regulations.delaware.gov/AdminCode/title7/7000/7400/7430.shtml#TopOfPage>
⁷ <https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document>
⁸ http://www.dnrec.delaware.gov/swc/wa/Documents/TMDL_TechnicalAnalysisDocuments/16_NanticokeMainTMDLAnalysis.pdf

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 5

Facility Name	Flow (mgd)	Daily Load			
		BOD5	Total P	Total N	Units
Seaford STP	2.0	91	15.2	61	kg/day
		200.62	33.51	134.48	lb/day
		73,227	12,231	49,086	lb/year

The TMDLs for Bacteria for the Chesapeake Bay Drainage Basin, Delaware require all point source bacteria loading in the entire basin (Chester River, Choptank River, Marshyhope Creek, **Nanticoke River**, Gum Branch, Gravelly Branch, Deep Creek, Broad Creek, and Pocomoke River Watersheds) to be capped at a geometric mean concentration level of 100 CFU enterococcus/100mL.

On December 29, 2010, EPA established the Chesapeake Bay TMDL.

Table 9-4. of the Chesapeake Bay TMDL Document⁹ lists the Seaford WWTF's waste load allocations as follows:

Table 9-4. Edge of Stream (EOS) WLAs (Annual) for the 478 significant permitted dischargers to meet TMDLs to attain the Chesapeake Bay WQS				
Facility	NPDES ID	TN EOS WLA (lbs/year)	TP EOS WLA (lbs/year)	TSS EOS WLA (lbs/year)
Seaford	DE0020265	24,364	6,091	48,729

The Department later developed "Watershed Implementation Plans" (WIP), to meet the requirements of the TMDL for the Chesapeake Bay. The Chesapeake Bay TMDL identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia and sets pollution limits necessary to meet applicable water quality standards in the Bay and its tidal rivers. The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025. The Jurisdictions affected by the TMDL were required to draft Watershed Implementation Plans (WIPs), which detail how and when the Bay jurisdictions will meet pollution allocations. There are three phases of WIPs developed by the Bay jurisdictions. Phase I and Phase II WIPs were developed and submitted to EPA in 2010 and 2012, respectively. Both Phase I and Phase II WIPs described actions and controls to be implemented by 2017 and 2025 to achieve the Chesapeake Bay TMDLs. Phase III was developed based on a midpoint assessment of progress through 2017.

Table 6 of the "Delaware's Phase II Chesapeake Watershed Implementation Plan¹⁰" lists the Seaford WWTF's waste load allocations as follows:

NPDES	Flow (mgd)	BOD5 (mg/l)	Total Nitrogen		Total Phosphorus		Total Suspended Solids	
			Conc. (mg/l)	WLA (lb/year)	Conc. (mg/l)	WLA (lb/year)	Conc. (mg/l)	WLA (lb/year)
DE0020265 - Seaford	2.0	12	4.0	24,364	1.0	6,091	8.0	48,729

⁹ https://www.epa.gov/sites/default/files/2014-12/documents/cbay_final_tmdl_section_9_final_0.pdf

¹⁰ http://www.dnrec.delaware.gov/swc/wa/Documents/ChesapeakePhaseIIWIP/Final_Phase2_CBWIP_03302012A.pdf

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 6

Table 3-15 of the “Delaware’s Phase III Chesapeake Watershed Implementation Plan (Phase III WIP)¹¹” includes 2025 goals for wastewater treatment plants which are based on WLAs for total nitrogen and total phosphorus with some notable modifications. The modifications which result from nutrient trading and nutrient load allocation transfer are discussed below.

Total Nitrogen (TN) and Total Phosphorus (TP)

Nutrient Trading

During 2013, the City of Seaford, INV Performance Materials, LLC (Formerly Invista) and DNREC developed a trading framework to establish the permit limits for Total Phosphorus (TP) and Total Nitrogen (TN) for the City of Seaford and INV Performance Materials, LLC based in part through use of trades of their WIP allocations for these pollutants. That framework is reflected in the “Nitrogen-Phosphorus Trading Agreement” (NPTA) executed by the City of Seaford and INV Performance Materials, LLC on August 15, 2014, and amended on August 12, 2015. The Department reviewed that NPTA and endorsed the trade via the current permit provisions. The trade does not affect the total load allocation in the watershed.

The current NPDES permit authorizes the use of trading as contemplated in the NPTA. The limits for TN and TP were developed based on the Delaware Watershed Implementation Plan (WIP) containing the applicable allocations, consistent with the Chesapeake Bay TMDL adopted by EPA in December 2010, and reflecting the trades of TN and TP by Seaford and INV Performance Materials, LLC (Formerly INVISTA) in the NPTA.¹²

Both the City of Seaford and INV Performance Materials, LLC permits reflect the parties’ agreements under the NPTA.

The basic terms of the NPTA that affect the proposed permits limits for TP and TN are as follows:

- Seaford accepts an enforceable permit limit for TP that is 4 lbs./day less than it would be assigned under the WIP TMDL and transfers its rights to this 4 lbs./day of TP to INV Performance Materials, LLC (Traded TP Allocation).
- INV Performance Materials, LLC accepts an enforceable limit for TN that is 27,431 lbs./year less than what it would be assigned under the WIP TMDL and transfers its rights to this 27,431 lbs./year of TN to the Seaford (Traded TN Allocation).

Consistent with State and Federal laws and regulations, the Department used the Traded TP Allocation of 4 lbs./day and the Traded TN Allocation of 27,431 lbs./year to establish the final limits for TP and TN in the current permits. The current permit also includes alternative limits for TN and TP which would be effective if the NPTA was terminated. Both the City of Seaford and INV Performance Materials, LLC have requested the TN and TP load allocations resulting from the NPTA to be made permanent. The load allocations resulting from the NPTA are reflected in

¹¹

<http://www.dnrec.delaware.gov/swc/district/Documents/CB%20WIP/DE%20Phase%20III%20WIP%2008232019%20with%20appendices.pdf> (Table 3-15)

¹² The confluence of INV Performance Materials, LLC’s effluent ditch with the Nanticoke River is 1.368 miles downstream (STORET Station 304151) from Seaford’s Outfall 001, so the permit does not require a “Delivery Ratio” for the trade.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility

Phase III WIP. Special Condition 5 in the current permit, which outlines NPTA requirements in the event of its termination, is therefore proposed to be removed.

Bridgeville Nutrient Load Transfer

The Town of Bridgeville owned and operated a sanitary sewer system for the Bridgeville/Greenwood service area. In May of 2016, the Town’s Commissioners signed a Administrative Order of Consent with the EPA mandating system improvements on tight timelines. Due to the significant rate impact, the Town Commissioners requested Sussex County investigate alternate solutions. Sussex County, in conjunction with the respective municipal engineering consultants, developed an alternate scenario for a Western Sussex County Sewer District connecting to the City of Seaford. This project would take the aging Bridgeville treatment system off-line and send the flows from Greenwood and Bridgeville to the City of Seaford where the effluent could be treated to a higher level and discharged in the Nanticoke River.

On April 29, 2021, the Bridgeville wastewater treatment facility was taken off-line, and all flows diverted to City of Seaford. The Bridgeville wastewater facility has now been demolished. As required in Special Condition 15 of the current permit, and after the Town’s Commissioners voted unanimously to surrender Bridgeville’s wasteload allocations for total nitrogen and total phosphorus, the loads were transferred to Seaford.

As discussed above, Phase III WIP includes 2025 goals for wastewater treatment plants based on WLAs with some notable modifications. For Seaford, the modifications reflect nutrient trading with INV Performance Materials, LLC, and nutrient load transfer from Bridgeville.

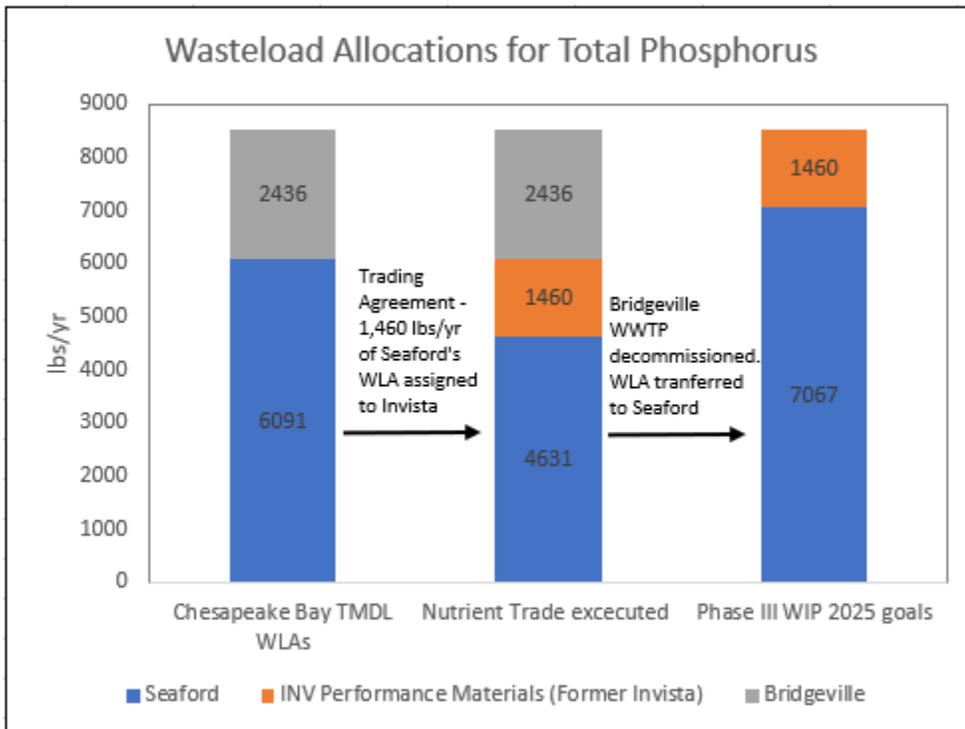
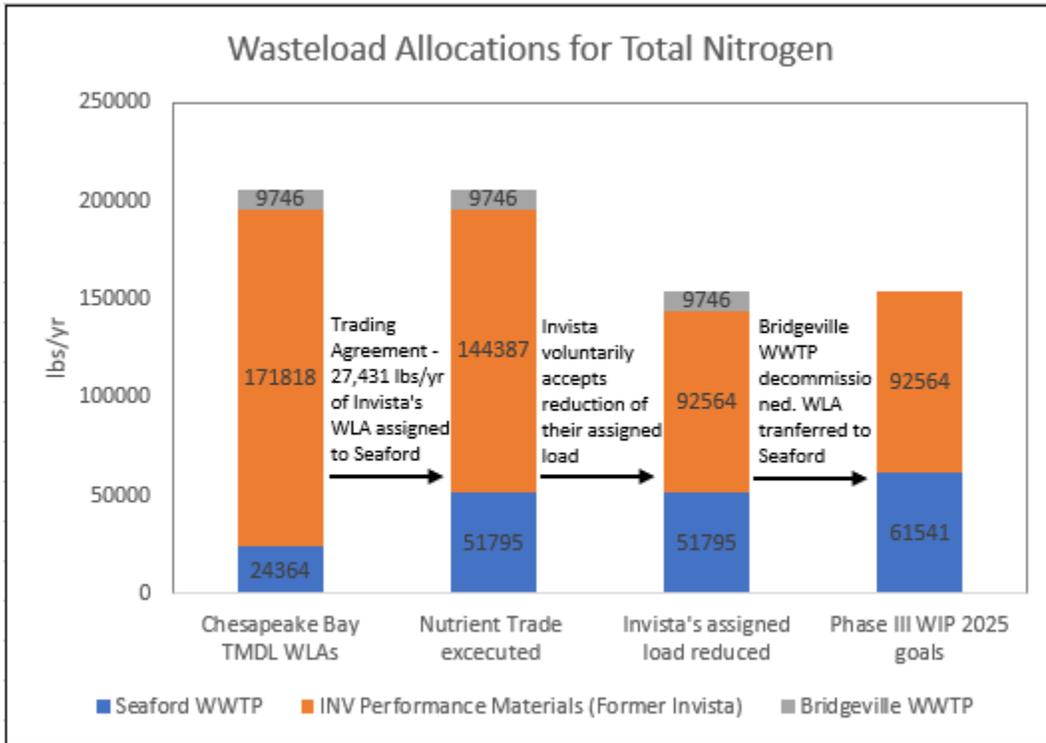
Table 3-15 of Phase III WIP¹³ lists the loads as follows.

Facility Name and NPDES Permit ID	Phase II WIP 2025 Goal (lbs/year)		Phase III WIP 2025 Goal (lbs/year)	
	TN	TP	TN	TP
Bridgeville Wastewater Treatment Plant (DE0020249)	9,746	2,437	0.0	0.0
Seaford Wastewater Treatment Plant (DE0020265)	24,367	6,092	61,544^{b,c}	7,069^{b,c}
INV Performance Materials (Former Invista) (DE0000035)	172,000	0.00	92,564 ^b	1,460 ^b
^b Nitrogen trade of 27,431 lbs/year from INV Performance Materials to Seaford WWTP. Phosphorus trade of 1,460 lbs/year from Seaford WWTP to INV Performance Materials. ^c Bridgeville’s nitrogen and phosphorus loads added to Seaford.				

The figures below reflect the TMDL WLAs and Phase III WIP 2025 goals.

13

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
 Page 8



The proposed TN and TP limits therefore reflect the load allocations resulting from the NTPA as well as the addition of Bridgeville's WLAs. Special Condition 5 in the current permit outlines the NTPA and requirements in the event of its termination. Since the proposed limits are based on a

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility

permanent status of the allocations resulting from the NPTA, Special Condition 5 is proposed to be removed.

TN and TP “Rolling 12-Month Cumulative Load Limits”

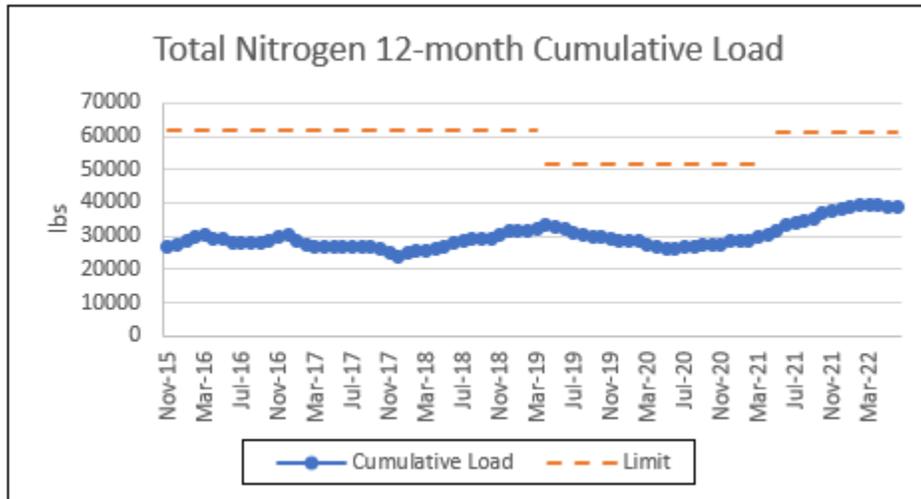
As stated in the “Chesapeake Bay TMDL Executive Summary”¹⁴,

“The TMDL is designed to ensure that all pollution control measures needed to fully restore the Bay and its tidal rivers are in place by 2025.”

The Phase III WIP 2025 goals for wastewater treatment plants in Table 3-15 above (TN 61,544 lbs/year and TP 7,069 lbs/year) are protective of water quality in the Chesapeake Bay. The current permit imposes the Chesapeake Bay requirements for TN and TP as rolling 12-month cumulative loads; that allows some day-to-day variability of the discharge and is still protective of the Chesapeake Bay. The limits in the current permit shown in the table below are based on Phase III WIP 2025 goals and account for Bridgeville’s nutrient load transfer discussed above. The proposed permit retains these limits and monitoring frequency.

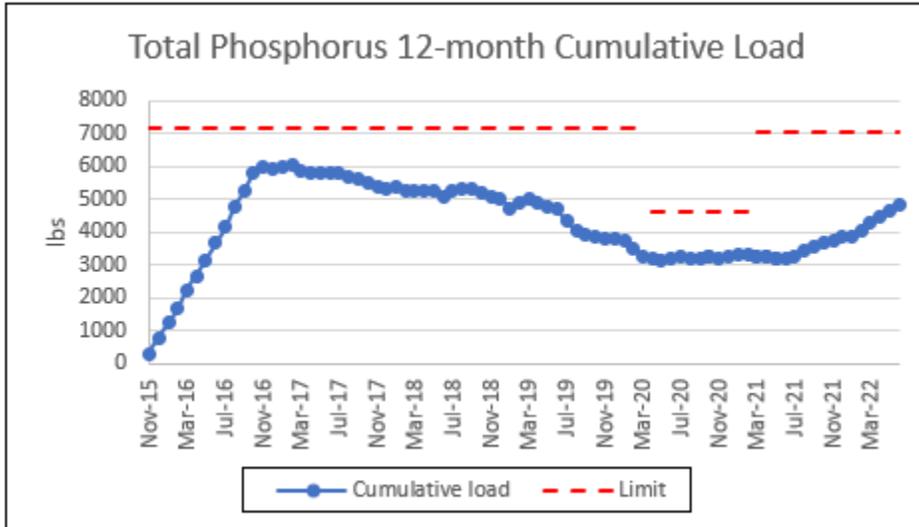
	TN (lbs/year)	TP (lbs/year)
Previous Limits	51,795	4,631
Bridgeville Allocation	9,746	2,436
Current Limits (Post Transfer)	61,541	7,067

The figure below shows the facility’s TN and TP annual load performance.



¹⁴ https://www.epa.gov/sites/default/files/2014-12/documents/bay_tmdl_executive_summary_final_12.29.10_final_1.pdf

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
 Page 10



TN and TP Daily Average Limits, aka “Average Monthly Limits” (AMLs)

The Nanticoke River and Broad Creek TMDL includes daily TN and TP requirements to meet the Delaware Surface Water Quality Standards (DeSWQS) for dissolved oxygen during the critical summer months. Prior to the transfer of Bridgeville’s load allocation to Seaford, the daily average limit for TP was based on a calculated value using the annual load allocation in the Chesapeake Bay TMDL which was more stringent than the allocation in the Nanticoke TMDL. The daily average limit for TN was based on Seaford’s allocation in the Nanticoke TMDL which was more stringent than the calculated value using the allocation in the Chesapeake Bay TMDL. To calculate limits based on the Chesapeake Bay TMDL allocations, a procedure found in EPA’s “Technical Support Document for Water Quality-based Toxics Control”¹⁵ had been used. The procedure allows calculation of limits that account for daily variability and still meet the long term average (LTA) requirements of the TMDL. The Chesapeake Bay WLA is set as the LTA and an “Average Monthly Limit” (AML) calculated as the 95th percentile of the data distribution.

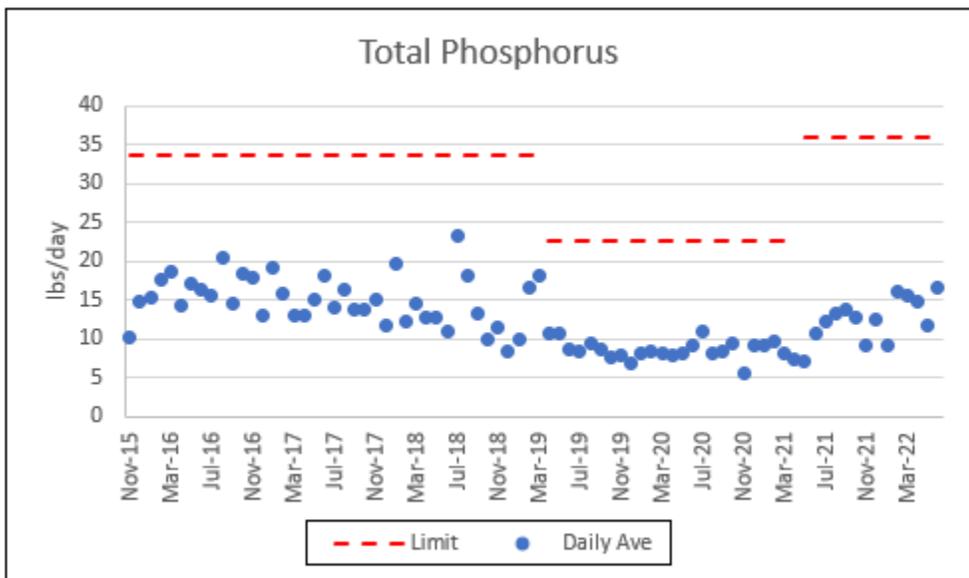
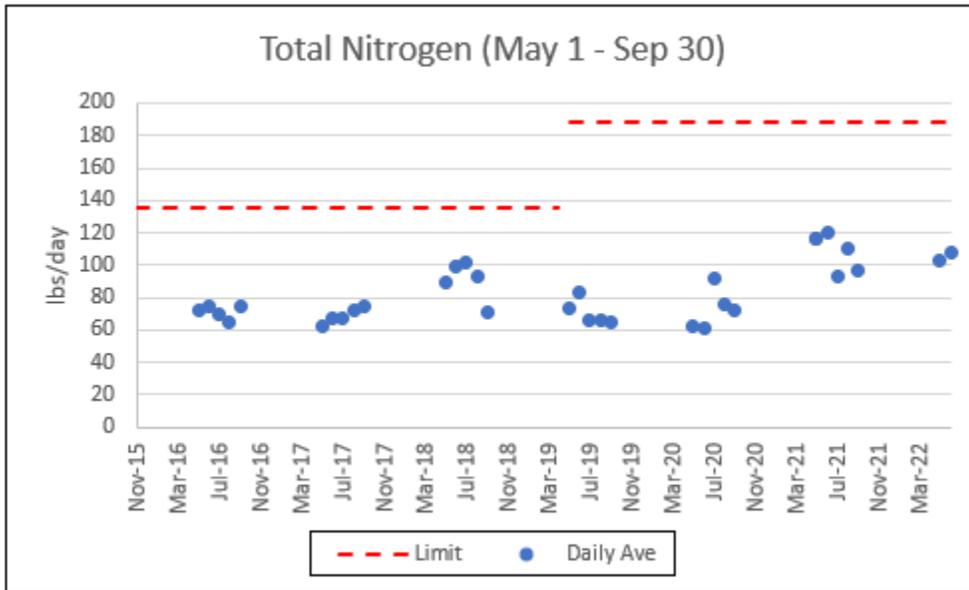
Following the transfer of Bridgeville’s load allocation to Seaford as required in Special Condition 15 of the current permit, new daily average limits went into effect. These limits are shown below and are proposed to be retained.

	TN (lbs/day)	TP (lbs/day)
Previous Limits	135	22.6
Bridgeville Allocation	52.9	13.4
Current Limits (Post Transfer)	187.9	36

The figures below show the facility’s TN and TP daily average performance.

¹⁵ <https://www3.epa.gov/npdes/pubs/owm0264.pdf>

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
 Page 11



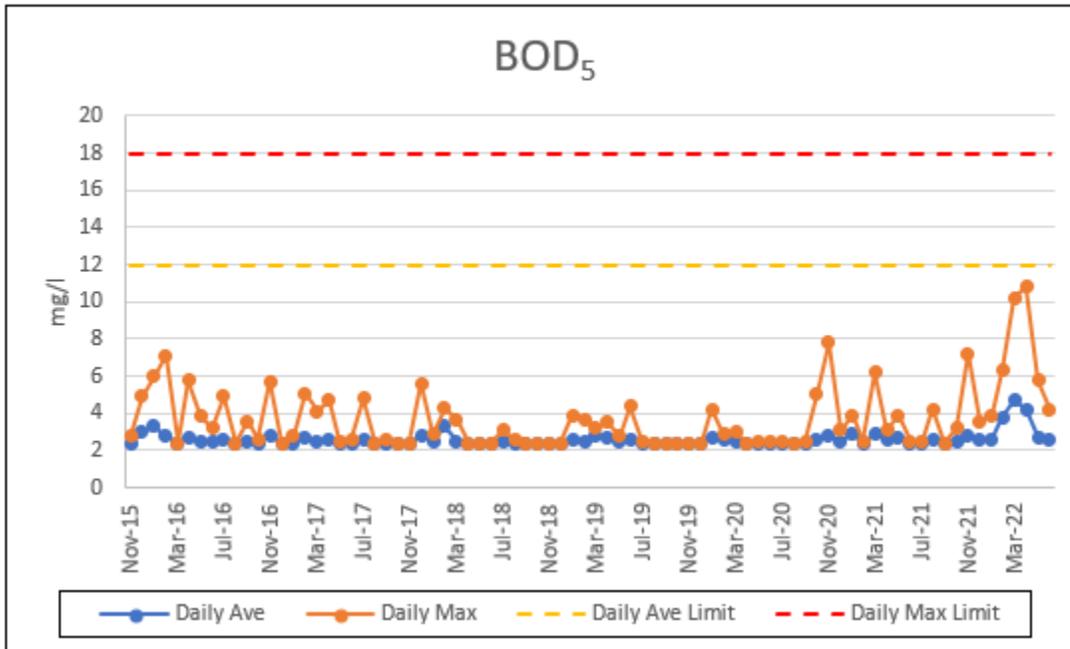
Special Condition 3 in the current permit specifically provides for reopening the permit, if necessary, to modify the effluent limitations for nitrogen and phosphorus based on TMDL requirements. As discussed above, the limitations in the proposed permit are based on the Nanticoke River TMDL and the Chesapeake Bay TMDL WLAs as reflected in Phase III WIP as 2025 goals. The proposed permit does not include interim limits and therefore removes Special Condition 3.

Biological Oxygen Demand, 5-Day (BOD₅)

The current BOD₅ limits are based on the Nanticoke River and Broad Creek TMDL. The proposed permit retains the current limits and monitoring requirements.

The figure below shows the facility's BOD₅ performance.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
 Page 12



Bacteria (Enterococcus)

The Department adopted TMDLs for bacteria in December of 2006 for the Chesapeake Bay Drainage Basin. In Delaware, this includes the Chester River, Choptank River, Marshyhope Creek, Nanticoke River, Gum Branch, Gravelly Branch, Deep Creek, Broad Creek and Pocomoke River watersheds. The adopted TMDL caps bacteria loading at a geometric mean concentration level of 100 col enterococcus/100mL.

The Delaware Surface Water Quality Standards (DeSWQS) include the following criteria.

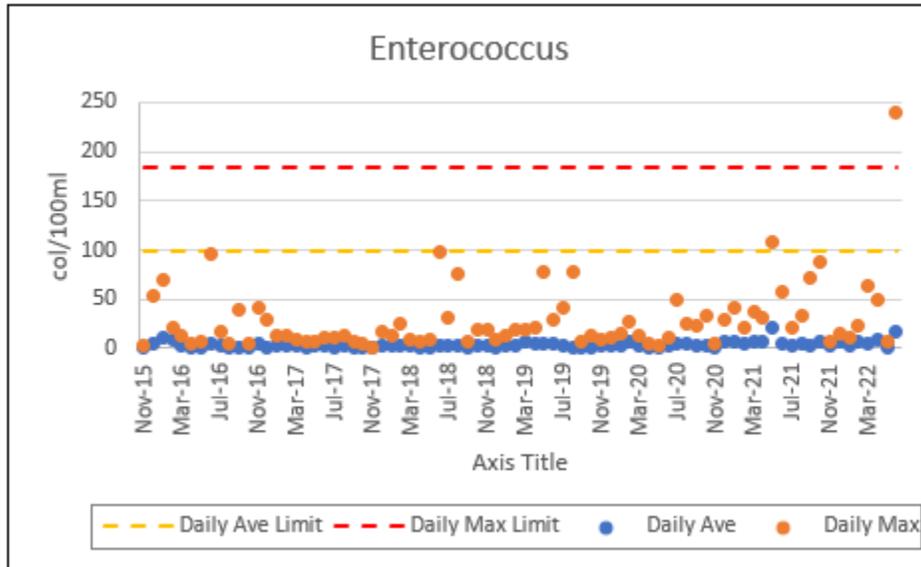
Table 1 – Delaware Surface Water Quality Standards for Bacteria		
4.5.7 Bacterial Water Quality Criteria		
4.5.7.1 Primary and Secondary Contact Recreation Waters:		
The following criteria shall apply:		
Waterbody Type	Single-Sample Value (Enterococcus Colonies/100ml)	Geometric Mean (Enterococcus Colonies/100ml)
Primary Contact Recreation Fresh Waters	185	100
Primary Contact Recreation <u>Marine</u> Waters	104	35
Secondary Contact Recreation Fresh Waters	925	500
Secondary Contact Recreation Marine Waters	520	175

“Marine Waters” does not apply at Outfall 001, so the current daily average limit of 100 colonies/100mL is based on the TMDL and is consistent with the criteria in the water quality standards above.

The current maximum daily limit of 185 colonies/100mL is based on the water quality standard above for “Primary Contact Recreation Fresh Waters”.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 13

The proposed permit retains the current limits and monitoring frequency at 3 days per week. The figure below shows the facility's enterococcus performance.

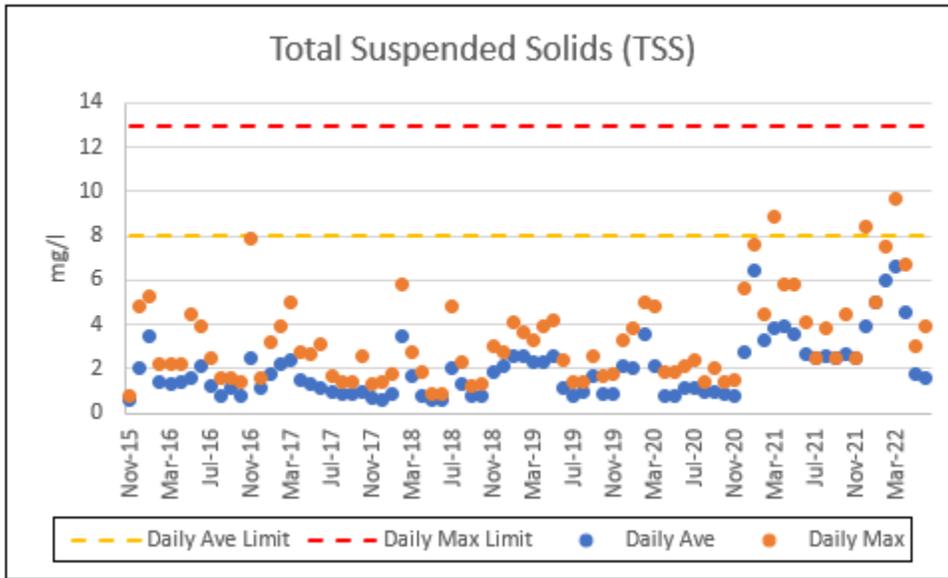


Total Suspended Solids (TSS)

The TSS load limit was established for a design flow of 1.08 mgd, technology-based concentration requirements from the Delaware's Regulations Governing the Control of Water Pollution (RGCWP). The load limit was retained when the design flow of the facility was increased, to the current 2.0 mgd, decreasing the effluent concentration limits. The current limits are consistent with the Chesapeake Bay TMDL WLA. The proposed permit retains the current limits and monitoring requirements.

The figure below shows the facility's TSS performance.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
 Page 14



Monitoring Requirements Related to Chesapeake Bay TMDL

The current permit requires monthly monitoring for specific parameters that the Department provides to the Chesapeake Bay Program. These requirements have been retained.

Nutrient Monitoring for Chesapeake Bay Program Reporting Requirements						
Abbreviation:	BOD5	DO	FLOW	NH3	NO23	TON
Parameter:	5-day biological oxygen demand	Dissolved oxygen	Flow	Ammonia (as N)	Nitrates + nitrites (as N)	Total organic nitrogen
Abbreviation:	TKN	TN	PO4	TOP	TP	TSS
Parameter:	Total Kjeldahl nitrogen (as N)	Total nitrogen (as N)	Ortho phosphate (as P)	Total organic phosphorus (as P)	Total phosphorus (as P)	Total suspended solids

Total Residual Chlorine (TRC)

The current permit has "none detectable" limit for TRC which is consistent with acute criteria for freshwaters in DeSWQS §4.5.9.3.1.2, Table 1, "Water Quality Criteria for Protection of Aquatic Life". The facility has consistently met this limit. The proposed permit retains both this limit and monitoring frequency.

pH

The proposed permit retains the current technology-based limitations are consistent with §4.5.3 DeSWQS §4.5.3. The facility has consistently met these limitations.

TSS and BOD₅ Removal Requirements

§7.7.2 of RGCWP, requires 92.5% removal of BOD₅ and TSS for facilities employing secondary treatment, filtration, nutrient removal, and disinfection. This requirement has been added to the

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 15

permit in Part III. A., Special Condition No.4. Influent monitoring requirements for BOD₅ and TSS have also been added to Part I.B.1., of the permit.

Pretreatment Program for Industrial Wastewater

The City of Seaford wastewater treatment facility accepts industrial wastewater from approved industrial users (IUs) and currently has an EPA-approved local pretreatment program. The pretreatment program is administered by EPA since the Department does not have authority to implement the program. The Program is designed to protect publicly owned treatment works (POTWs) infrastructure and reduce conventional and toxic pollutant levels discharged by industries and other nondomestic wastewater sources into municipal sewer systems. POTWs with an approved pretreatment program are required to submit test results for additional pollutants with their permit application. Seaford is therefore subject to this requirement and submitted the test results with the permit application.

Special Condition 13 outlines the requirements of the program.

Storm Water Plan (SWP)

Per Delaware Regulations Governing Storm Water Discharges Associated with Industrial Activities, some publicly-owned treatment works (POTWs) are required to have a Storm Water Plan (SWP):

*Treatment works with a design flow of one (1) million gallons per day or more treating domestic sewage or any other sewage sludge or waste water treatment device or system, used in the storage, treatment, recycling and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, **or required to have an approved pretreatment program under 7 Del. C. §6033.** Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 C.F.R. §503.*

Seaford does have a Pretreatment Program, so the proposed permit retains Special Condition No. 8 which requires Seaford to continue to maintain a Storm Water Plan.

Whole Effluent Toxicity (WET) Testing

“Whole Effluent Toxicity” measures total toxicity of a wastewater discharge by exposing organisms to the effluent at various dilutions with clean water, then measuring the effects. For example, if a sample with 10% effluent and 90% clean water kills all of the test organisms, it is much more toxic than a sample with 90% effluent and 10% clean water with the same effect. “Acute toxicity” tests measure survival.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 16

The EPA WET analytical method requires testing for one invertebrate and one vertebrate, respectively Pimephales Promelas (minnow) and Ceriodaphnia Dubia (water flea), for Seaford’s Outfall 001.

The current permit requires acute biomonitoring test on 100% effluent, once per year. A definitive test is required if the survival rate is less than 80%. The permittee is required to submit a plan to address toxicity issues if the results of the definitive test indicate that the LC50 is less than 100% whole effluent. LC50 is defined as the lethal concentration to 50% of the test organisms. It is a measure of the effluent concentration at which 50% mortality of the test organisms occurs. The table below shows the biomonitoring results over the period of the current permit. The proposed permit retains the biomonitoring requirements.

Outfall 001 Whole Effluent Toxicity Test Results (%Effluent)		
Sample Date	Ceriodaphnia dubia 48-h Acute	Pimephales promelas 48-h Acute
	48 hr LC50	48 hr LC50
11/2/15 (Definitive)	>100	>100
10/3/16	>100	>100
11/6/17 (Definitive)	>100	>100
10/1/18	>100	>100
9/30/19	>100	>100
10/5/20	>100	>100

Metals

The renewal application includes results of a metals scan of the 001 effluent. Monthly and quarterly monitoring is required for dissolved copper and dissolved zinc respectively, as well as effluent hardness since the zinc criteria are hardness dependent.

The EPA “Technical Support Document for Water Quality-based Toxics Control”¹⁶ (TSD) provides a methodology for a “Reasonable Potential” (RP) Analysis to identify if a pollutant has a reasonable potential to cause or contribute to water quality problems in the receiving waters. The RP Analysis uses data from renewal applications and monthly electronic Discharge Monitoring Reports (eDMR) and compares them to all applicable technology-based standards and State water quality standards (while accounting for dilution where applicable). State technology standards are found in the *Regulations Governing the Control of Water Pollution* (RGCWP), §7.1. Federal technology standards are found in the Effluent Limitation Guidelines (ELGs). Technology-based standards are a minimum level of treatment required for NPDES discharges, considering wastewater treatment technologies. When multiple technology and water-quality based standards exist for a specific pollutant, the NPDES permit limit is based upon the requirement that results in the strictest limit.

Mixing and Dilution at Outfall 001

The Watershed Assessment and Management Section (WAMS) in the Division of Watershed Stewardship performed a mixing and dilution analysis to determine if complete mixing between

¹⁶ U.S.E.P.A., Office of Water (EN-336), March, 1991, EPA/505/2-90-001, PB91-127415

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 17

Seaford's effluent and the Nanticoke River at the discharge location (within time scales relevant to toxics water quality criteria) can be assumed. The analysis was presented in a report "Mixing and Dilution Analysis for the Seaford Wastewater Treatment Plant Discharge and the Nanticoke River" in 2018. The conclusion in the report, which has been reviewed by EPA, is that the effluent mixes rapidly and completely with the Nanticoke River at the point of discharge.

According to §6.1 of the DeSWQS, if it is determined that complete mix of effluent and receiving water occurs at the point of discharge, critical flows as provided in Section 7.0 are applied in determining if the applicable criteria are met. To determine the critical flows of the Nanticoke River at Seaford's discharge point (Outfall 001), the "ratio of drainage area" method was used. This method is commonly used to estimate streamflow for sites where no streamflow data are available using data from one or more nearby streamflow-gaging stations. It equates the ratio of streamflow at two stream locations to the ratio of the respective drainage areas. Data from USGS Flow Gage 01487000 (located on the Nanticoke upstream of Seaford in the non-tidal portion of the River) was used. The USGS website tool "StreamStats"¹⁷ was used to generate drainage area reports and low flow data.

Reasonable Potential Analysis

Effluent data reported in the eDMR and permit renewal application was used in the RP analysis (RPA). For pollutants reported as non-detect, a conservative approach was used by assuming the pollutants to be present at the method detection limit (MDL). The current permit contains limits for copper and requires monitoring for zinc. The eDMR data for the two metals was used in the analysis. For other metals, the data reported in the permit application was used.

The results of the RPA did not show the need for water quality-based limits

Copper

Copper toxicity can be highly variable and dependent on ambient water chemistry. In May 2017 the State adopted new freshwater criteria for copper, the Biotic Ligand Model (BLM) which replaced the hardness dependent criteria. The BLM was developed as a tool to account for variations in metal toxicity using local water chemistry. The BLM requires 10 parameters to determine the criteria. To account for seasonal and other possible variations, at least 12 months of monthly monitoring data for the 10 parameters are required. The parameters needed to run the BLM model for copper are pH, dissolved organic carbon (DOC), alkalinity, temperature, major cations (calcium, magnesium, sodium, and potassium), and major anion (sulfate, chloride). The model also requires humic acid (HA) fraction of DOC. According to the BLM User Guide¹⁸, natural organic matter is not routinely characterized and information on HA is not likely to be available. In the absence of information on HA, a value of 10% is recommended.

In 2018, the Department proposed a permit modification which included copper limits based on the BLM criteria. BLM parameters collected by the permittee over a period of 24 months to account for seasonal variations, were used. For HA, the recommended value of 10% (or 0.1) was used as this information was not available. Sampling was conducted (concurrently) at the outfall (effluent sampling) and at an upstream location representing ambient conditions in the Nanticoke River. Determination of criteria was as follows:

¹⁷ <https://streamstats.usgs.gov/ss/>

¹⁸ https://www.windwardenv.com/images/BLM_manual_Research_2019-05-22.pdf section 4.1.4 page 9

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 18

- Mass balance calculations were applied to determine the values required to run the BLM (BLM input values).
- The BLM was run using the input parameters calculated above to predict instantaneous water quality criteria (IWQC). The BLM output is criterion maximum concentration (CMC) and criterion continuous concentration (CCC) for each of the 24 months.
- The 5th percentile of the 24 sets of CMC and CCC was determined and used as copper criteria.

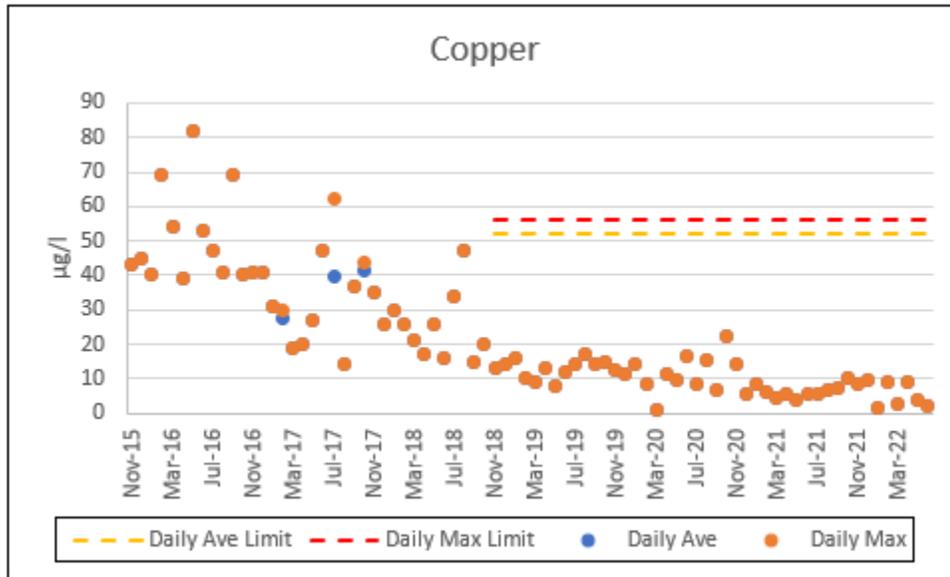
The BLM User Guide explains that the variability of HA in diverse water sources has not been found to be an especially critical parameter. It was however noted that HA is a critical parameter for the low hardness waters in the Nanticoke watershed. For example, increasing the HA fraction to 20%, significantly affects the resulting criteria. The Watershed Assessment and Management Section (WAMS) has been coordinating efforts to determine HA fraction for the Nanticoke watershed. According to WAMS, preliminary results suggest a HA fraction closer to 0.4 (40%) expected for the Nanticoke watershed.

In a letter dated October 26, 2018, the permittee submitted comments on the draft permit modification. The permittee objected to the methodology described above which the Department used to develop the BLM-based copper criteria, indicating that it resulted in limitations beyond necessary to protect aquatic life. The letter included a report prepared by Seaford's consultants, Hall & Associates describing their assessment. According to the report, the use of a low percentile (5th percentile) of the 24 sets of IWQC greatly compounded conservative assumptions resulting in unduly restrictive effluent limitations and that it was contrary to proper implementation of criteria for metals when deriving effluent limitations based on critical low flow conditions. The report proposed an alternative methodology by showing a correlation between IWQC and Nanticoke River flow, from which BLM-based copper criteria expected during critical (low) flow conditions were determined

EPA Headquarters reviewed the report and provided their response in a letter to the Department dated March 6, 2019. According to the letter, EPA Headquarters conducted its own statistical analysis of the BLM-based IWQC. They agreed that the BLM-based copper criteria could be derived using a statistical method different from the 5th percentile originally used. While both Seaford's and EPA's analyses were based on the correlation between IWQC and Nanticoke River flow, EPA recommended using a linear regression model as the more appropriate fit for the data over the power model used in Seaford's analysis. Seaford through its consultant Hall & Associate, reviewed EPA's recommendations and prepared a report dated March 22, 2019 in response to the recommendations. The report included a response to the questions posed in EPA's letter and provided supporting information to demonstrate the power model as the more appropriate model for evaluating the BLM data for this site.

With evaluation of the methodology to establish BLM-based criteria, including determination of HA fraction for the Nanticoke River still ongoing, the hardness-based limits were retained pending the outcome of the evaluation. Subsequently, Secretary Order No. 2019-W-0029 was issued containing performance-based limits as interim limits. As shown below, a significant reduction in copper levels in the effluent occurred after Allen Harim Hatchery stopped discharging following cessation of production in 2019. The Hatchery had been identified as a significant source of copper through a source track down study conducted by the permittee. The facility has consistently continued to perform well below the performance-based limits

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 19



A reasonable potential analysis has been performed using BLM-based criteria derived as the 5th percentile of the 24 sets of IWQC. The dilution allowance used was based on complete mixing of the effluent and Nanticoke River discussed above. The results of the analysis did not indicate a need for limits. While other statistical methods discussed above can be used to derive BLM-based criteria, it is not necessary to conduct reasonable potential analysis using criteria derived from those methods as the 5th percentile results in more stringent criteria. The proposed permit therefore removes the copper limits and retains monitoring only. Delaware RGCWP §6.15.11 has “anti-backsliding” requirements that restrict issuance of permits with less stringent requirements than the previous permits, but with some exceptions. The draft permit proposes to remove copper limitations based on the results of analysis performed using new mixing and dilution information, and therefore qualifies under the exception provided in RGCWP §6.15.11.3.2.1, “Information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.”

Zinc

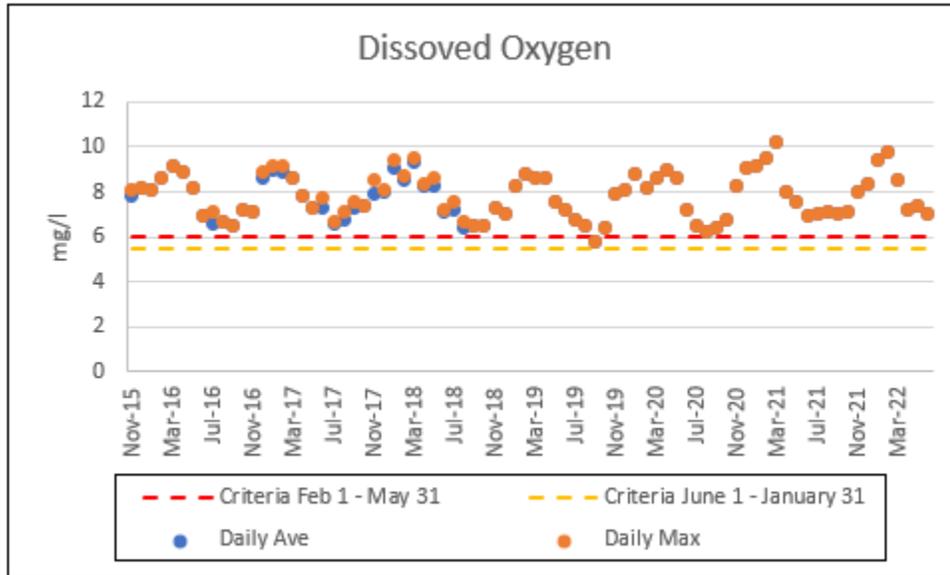
The current permit includes quarterly monitoring for zinc. A reasonable potential analysis was performed for the data submitted in the eDMR. The results of the analysis did not indicate a need for limits. The proposed permit retains quarterly monitoring.

Dissolved Oxygen (DO)

The Nanticoke River from the upstream-most limits of the City of Seaford to the Maryland State Line and the Broad Creek from the upstream-most limits of the Town of Laurel to the confluence with the Nanticoke River have special criteria for DO in subsection 4.5.2.4 of DeSWQS that are protective of open water fish and shellfish and migratory fish spawning and nursery designated uses consistent with the Maryland portion of the tidal Nanticoke River and as described in the U.S. Environmental Protection Agency document “*Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries*” (EPA 903-R-03-002). The facility currently monitors DO as part of the reporting requirements for the

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 20

Chesapeake Bay Program. The figure below compares the DO concentrations in the facility's discharge to the two most stringent instream criteria listed in subsection 4.5.2.4 of DeSWQS. "7-day mean shall not be less than 6 mg/l for the period Feb 1 – May 31" and "30-day mean shall not be less than 5.5 mg/l." The facility shall continue to monitor DO.



Special Conditions

Special Condition No. 1 states that this permit supersedes the State Permit WPCC 3161F/74 and NPDES Permit DE 0020265 issued on September 30, 2015, with an effective date of November 1, 2015 and modified on November 30, 2018.

Special Condition No. 2 is a permit re-opener clause.

Special Conditions No. 3 lists requirements for complying with "None Detectable" total residual chlorine limits.

Special Condition No. 4 requires the permittee to demonstrate a minimum of 92.5% reduction in the raw waste TSS and BOD₅ concentrations on a monthly average basis prior to discharge.

Special Condition No. 5 outlines the requirements for monitoring and reporting Nitrogen and Phosphorus species.

Public-Notice Fact Sheet
City of Seaford Wastewater Treatment Facility
Page 21

Special Condition No. 6 specifies calculations for “Rolling 12-month cumulative loads”.

Special Condition No. 7 lists requirements for testing and reporting acute whole effluent toxicity for Outfall 001.

Special Condition No. 8 requires continued implementation and maintenance of a Storm Water Plan.

Special Condition No. 9 requires proper licensing for wastewater treatment plant operators.

Special Conditions Nos. 10, 11, and 12 list requirements for sludges generated in the NPDES wastewater treatment process.

Special Condition No. 13 requires operation and implementation of an industrial pretreatment program.

Special Condition No. 14 requires the permittee to use EPA-approved analytical methods that are capable of detecting and measuring the pollutants at, or below, the applicable water quality criteria or permit limits pursuant to 40 CFR Part 136.

Antidegradation Statement

The proposed effluent limitations in the NPDES permit comply with the applicable portions of Delaware’s *Surface Water Quality Standards*, Section 5.0, “Antidegradation and ERES Waters Policies”.

Public Notice and Process for Reaching a Final Decision

The public notice of the Department’s receipt of the application and of reaching the tentative determinations outlined herein will be published in the Wilmington News Journal and the Delaware State News on **May 24, 2023**. Interested persons are invited to submit their written views on the draft permit and the tentative determinations made with respect to this NPDES permit application. The Department will not hold a public hearing on this application unless the Department receives a meritorious request to do so or unless the notice of this proposal generates substantial public interest. A public hearing request shall be deemed meritorious if it exhibits a familiarity with the application and a reasoned statement of the permit’s probable impact. The request for a public hearing shall be in writing and shall state the nature of the issues to be raised at the hearing. All comments received by the close of business at **4:30 pm on June 23, 2023**, will be considered by the Department in preparing the final permit.

Department Contact for Additional Information

George Mwangi, P.E., Engineer IV
Commercial and Government Services Section, Division of Water
Department of Natural Resources and Environmental Control
89 Kings Highway, Dover, DE 19901
Telephone: (302) 739-9946 Facsimile: (302) 739-8369
Email: George.Mwangi@delaware.gov